

# **CRUCIAT LIGAMENT SURVEY REPORT 2010**

*On behalf of the Chow Chow Breed Council 2010*

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*Fig 1 nearly normal joint*



*fig 2 damaged joint*

*(Pictures - [www.Marvistavet.com](http://www.Marvistavet.com))*

## **ABSTRACT**

The Kennel Club breed information advice suggests that Cruciate Ligament Injuries have been cited by insurance companies as one of the most common claims made for Chow Chows. Whilst it is recognised that Cranial Cruciate Ligament (CCLs) rupture does occur in Chow Chows we do not know the frequency of occurrence within the breed.

The breed council circulated a detailed questionnaire to breeders, exhibitors and pet owners of Chow Chows to gain a better understanding of the size of problem and explore which factors might increase the risk of injury occurring.

The results suggest that breeders are aware that CCLs do occur in the breed but that such injuries occurred in only a small percentage of the chows included in this survey and did not require surgery to stabilise the joint.

## **INTRODUCTION**

Following the program Pedigree Dogs Exposed where the breeding of pedigree dogs was called into question, The Kennel Club increased their endeavours to ensure fitness for function at which time the Chow Chow was felt to be an 'at risk' breed with the high incidence of CCL to be a major concern. One of the measures taken by the Kennel Club has been to make subtle changes to the Chow Chow Breed Standard with regard to the wording used to describe movement. This suggests that the Kennel Club have some reservations about the angulation and movement associated with the chow and an increased risk factor for CCLs.

Insurance company data indicates that CCL injuries are one of the most common pet insurance claims for Chow Chows. However, no comparison figures have been provided that might indicate how serious this problem in relation to the Chow Chow. A comprehensive Danish study into cruciate ligament injuries in Chow Chows also noted that Chows appear to be more likely to suffer such injuries (4 -16%) than other breeds in general (1.6 – 1.8%) Torngren & Arnbjerg (2003).

Whilst we acknowledge that a number of sources suggest that Chow Chows are one of a number of breeds with a higher than average incidence of CCLs, we do not know how high the incidence actually is, or why the Chow Chow appears to have a higher than average incidence CCLs. The Chow Chow Breed Council circulated a survey to gather information from a wide variety of Chow Chow owners collecting information about owner's experiences with CCLs from which a better idea of the proportion of Chow Chows with CCLs and any factors that could be associated with increased risk of such injuries.

It is acknowledged that CCLs occurs in any breed, it is suggested that most at risk are females, particularly neutered and/or overweight females. Dogs that are poorly conditioned, large and giant breeds are also more prone to CCLs (health communities com.) Other contributory factors most commonly cited are:-

- Age
- Gender and/or neutered animals
- Arthritis
- Injury to stifle joint
- Overweight
- Poor musculature near the joint
- Structural abnormalities (e.g., bow-legged, luxated patella)

These factors were also considered in the Danish study and were included in the survey carried out by the Chow Breed Council in 2009/2010 and are also factors considered in the Breed Council survey. The survey also considers the possibility of a hereditary predisposition for increased risk of CCLs in the questionnaire.

This survey focused only on Chow Chows no comparison was made with other breeds.

## **Method**

### **Design**

Microsoft Excel Pivot tables were used to identify where a distinct relationship could be identified between a variety of factors and cruciate ligament injuries. Graphs showing such comparisons were generated using Microsoft Excel.

### **Participants**

25 Chow Chow owners returned completed questionnaires. No selection process for respondents was used. No information that could identify dogs or owners was required. It would appear from the responses that the participants ranged from Chow owners who were new to the breed as well as long standing Chow owners, breeders and/or exhibitors with larger numbers of chows. A total of 357 chows were represented in the survey providing an ample spread of gender, size, weight and age data.

### **Materials**

The questionnaire was created using a computer and printer. The results were collated and processed using Microsoft Office Excel 2007 and pivot tables.

The questionnaire was in four parts. The first asked for information on all dogs owned, the second section collected information about dogs with cruciate ligament injuries whose were born during the period January 2004 to December 2008. The third section collected information about dogs with cruciate ligament injuries born during the period January 1999 and December 2003 and the fourth section focused on dogs with cruciate ligament injuries that were born before January 1999.

## Procedure

The questionnaire was circulated via the Chow Chow Breed Clubs, Club web sites, at shows and by post and advertised in Chow Chow breed notes in Dog World and Our Dogs newspapers. Respondents were invited to respond via breed club secretaries, post or emails. On receipt questionnaires were given an identifying number and entered into the computer for collation to maintain anonymity. Microsoft Excel Pivot tables were used to process data and produce graphs showing which of a number of factors were most likely to be associated with increased risk of cruciate ligament injuries.

## Results

The main focus of the survey was threefold; firstly to assess the scale of the problem by assessing the proportion of chows that have had cruciate ligament injuries. Secondly to assess which of a variety of factors would best predict a predisposition to such injuries, and finally to explore if there was any evidence of hereditary elements of a predisposition for such injuries.

Of the 357 Chow Chows included in this survey 42 (11.7%) were reported to have experienced cruciate ligament injuries (fig 1)

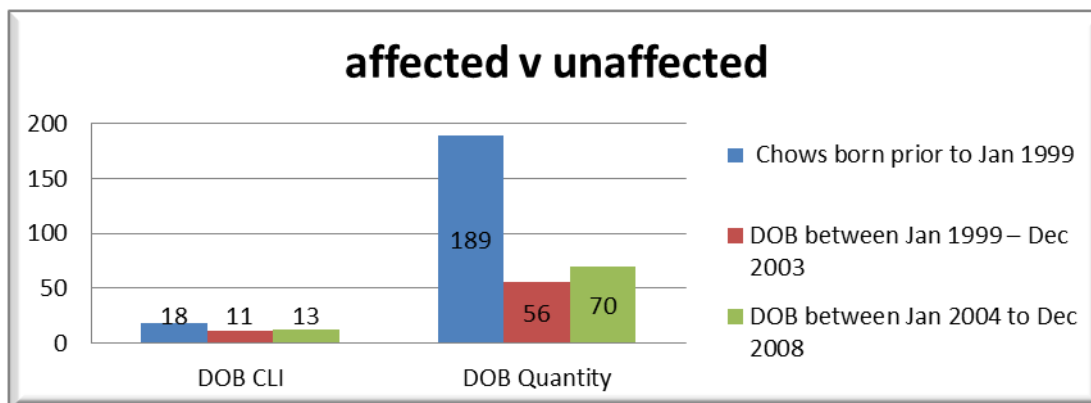


Fig 3 graph showing numbers of affected compared to total number of chows in each group

The graph shows that the numbers of reported injuries were relatively consistent for the most recent two periods showing that chows born between Jan 2004 and Dec 2008 there were 13 (18.5%) affected chows reported from a total of 70 chows. In the group of chows born between Jan 1999 and Dec 2003 there were 11 (19.6%), affected chows reported from a total of 56 chows. The last group reported 18 (9.5%) affected chows from a total of 189 chows, chows born before 1999; this suggests that the incident of injuries has risen considerably in the more recent periods.

The second question asked if there were any particular factors that could be associated strongly with increased risk of cruciate ligament injury. The survey looked at a number of factors commonly thought to be associated with increased

risk of cruciate ligament injury, comparing it with factors listed from previous studies and information sources above.

**AGE:** - The data suggests that the highest percentage of injuries occur in Chows under 1yr of age (53% of all affected dogs) in each of the three groups, with fewer incidents occurring after two years of age (25%) (fig 4). (The data relates to 39 chows, there was no data submitted for the remaining 3 chows)

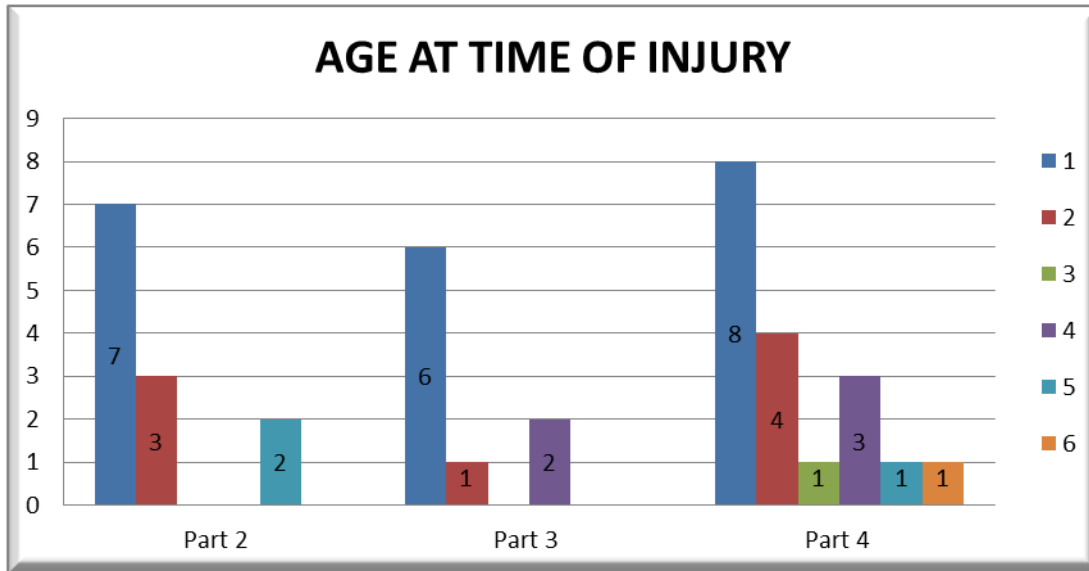


Fig 4 graph shows the age at time of injury for each grouping. Part 2 represents the DOB period Jan 2004 and Dec 2008; Part 3 Jan 1999 and Dec 2003; and part 4 pre 1999

**Sexual status :-** Fig 5 suggests that intact bitches are more susceptible to CCLs than entire males or neutered Chows (fig 6) however it must also be noted that when looking at the total number of chows (unaffected and affected) that there is a higher proportion of bitches (65%) than dogs (29%) or neutered chows (5%) (see fig 5.)

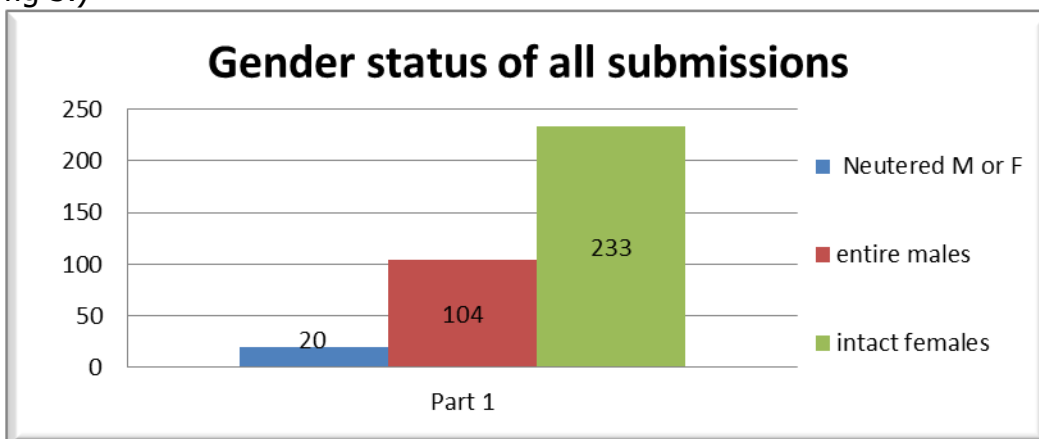


Fig 5 indicates the proportion of the total numbers of females, males and neutered chows included in the study

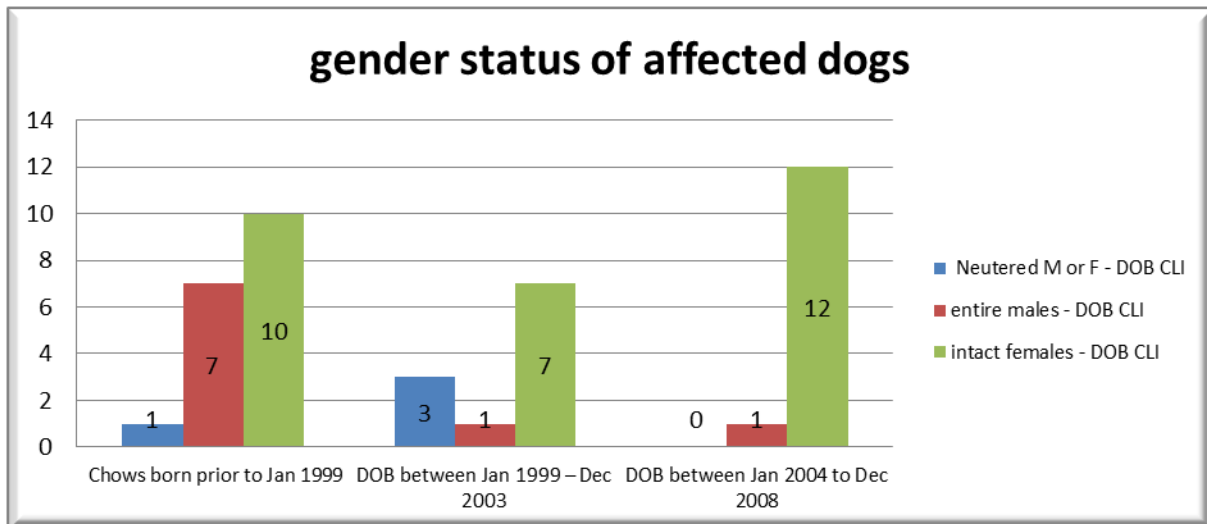


Fig 6 shows the variations between sexual status and incidents of CCL injuries

Fig 6 shows that the problem occurs more frequently in bitches 69% with CCL injuries compared to the number of males 21% with CCL and neutered chows 9% but these numbers must be considered in context. The number of bitches reported represents 12.5% of all the bitches included in the survey, the number of affected males represented 8.5% of the total number of males, whereas the number of neutered chows represented 20% of all neutered chows included in the survey.

The evidenced supports the claims that intact females are more at risk of incurring CCLs than entire males but the chows most at risk are those that have been neutered.

**General activity levels:** - The survey looked at the activity levels of the affected dogs and found that the majority of chows with CCL injuries were found in the moderately active group (40%) based on 37 chows whereas couch potatoes were far less likely to suffer CCL injuries. (fig7)

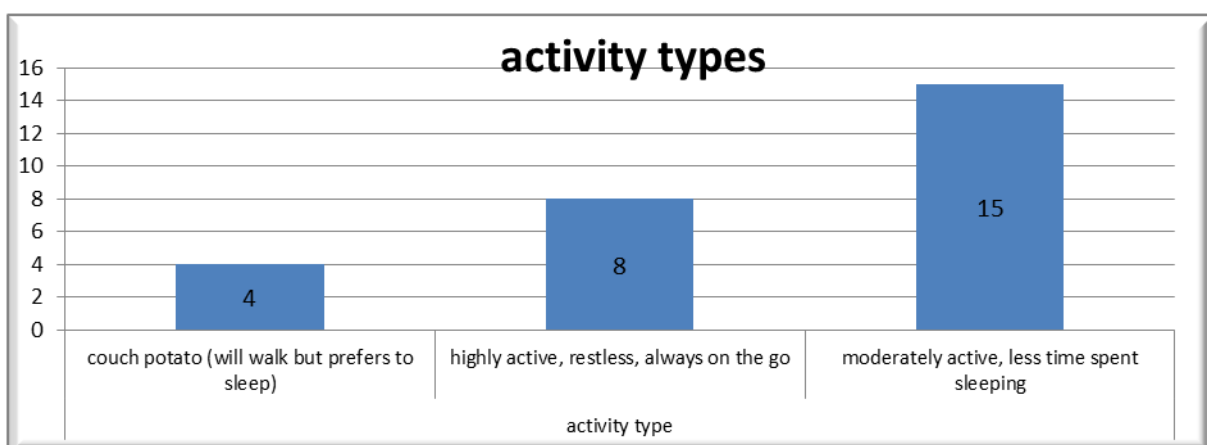


Fig 7 graph showing the typical activity levels of injured chows.

The highest number of injuries appears to occur in those Chows that have free range exercise in the garden or run area with other chows and were significantly less likely to occur in Chows that were regularly road walked on leads.

The data suggests that injuries are far more likely to occur when Chows are given free running exercise regimes. Of the 32 dogs included in this element of the survey 25 (78%) were exercised predominantly by free running only (Fig 8).

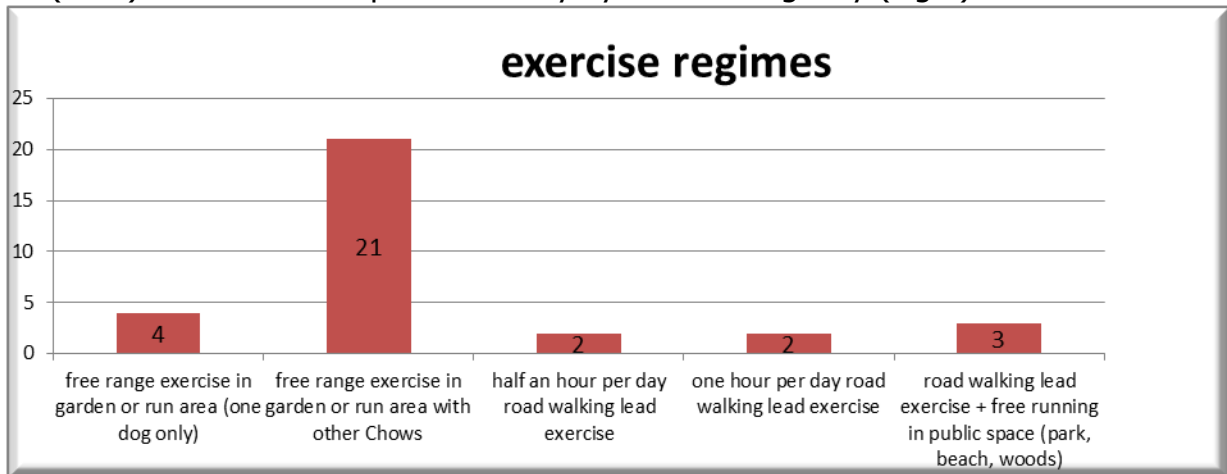


Fig 8 typical exercise regimes

The dog twisting suddenly 13 (30%) was the most common reported activity of the named categories, however there were a wide variety of other activities cited by the remaining 50% of respondents with a number reporting that they did not see the injury occur (fig 9).

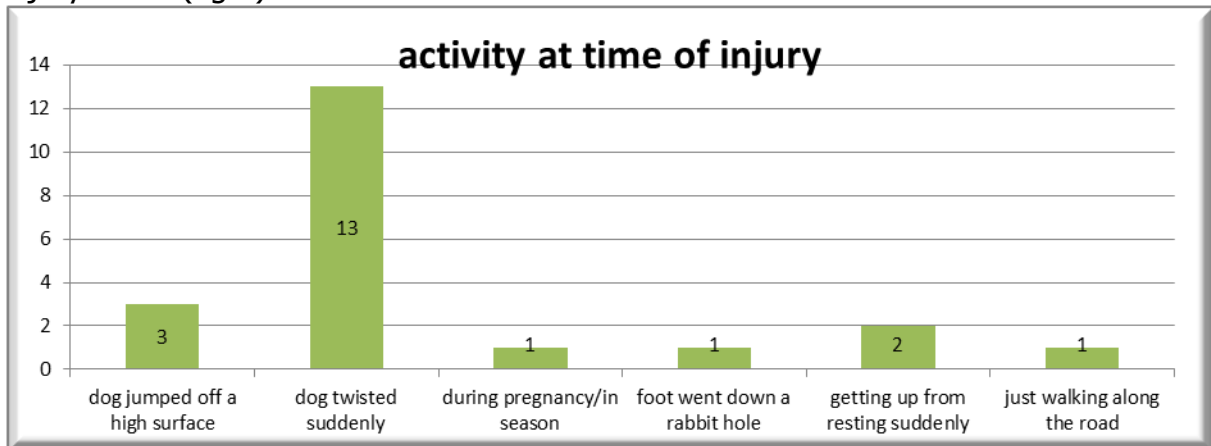


Fig 9 represents the observed activity at the time that the injury occurred

The largest proportion of affected chows lived solely within the house 22 (59%) (Based on 37 reports) with remainder either exclusively kennelled 13 (35%) or spent time between kennel and home 2(5%). (fig10)

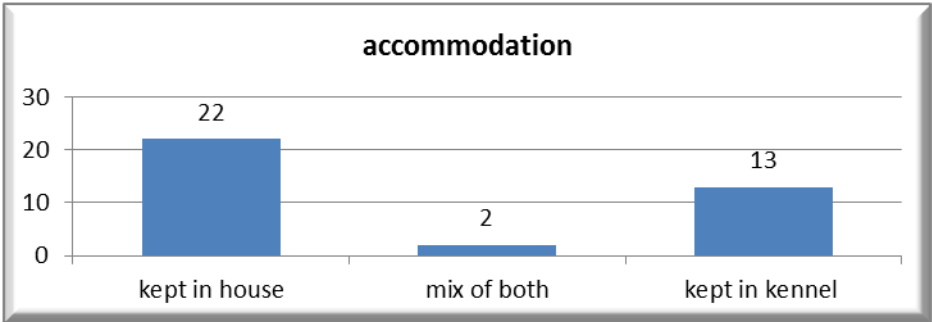


Fig 10 showing typical accommodation arrangements of affected Chow Chows.

When comparing recorded weights and heights of the affected chows the survey shows that the majority of those reported 29 (70%) fall below 19" to the withers (fig 11) and that the majority of weights recorded 30 (71%) fall below 55lbs (fig12).

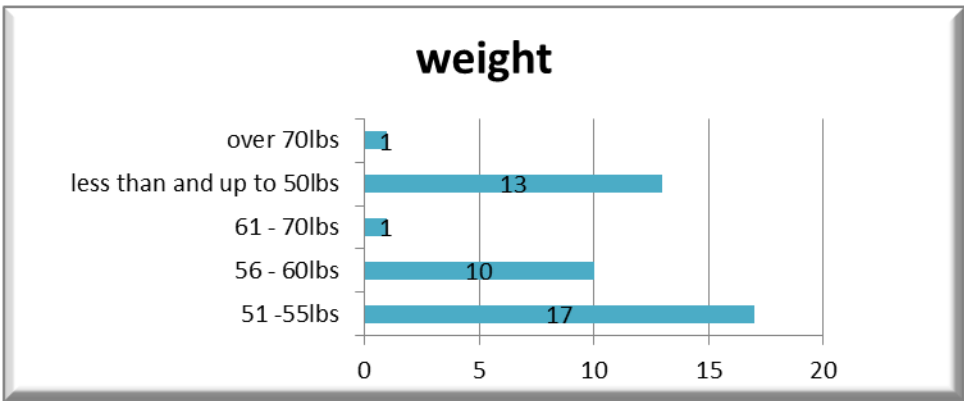


Fig 11 approximate heights reported

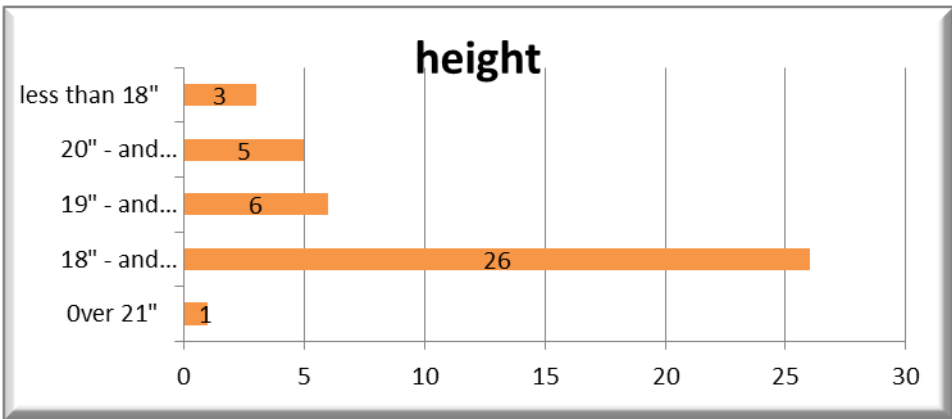


fig 12 approximate heights reported

There is little evidence to suggest familial links between affected dogs, only 4 chows were found to have dams that had either joint stiffness or CCL injuries, 3 with a sibling (brother or sister) with joint stiffness or hind leg injuries and 3 with a sire that had either stiffness or injury. (fig 13)



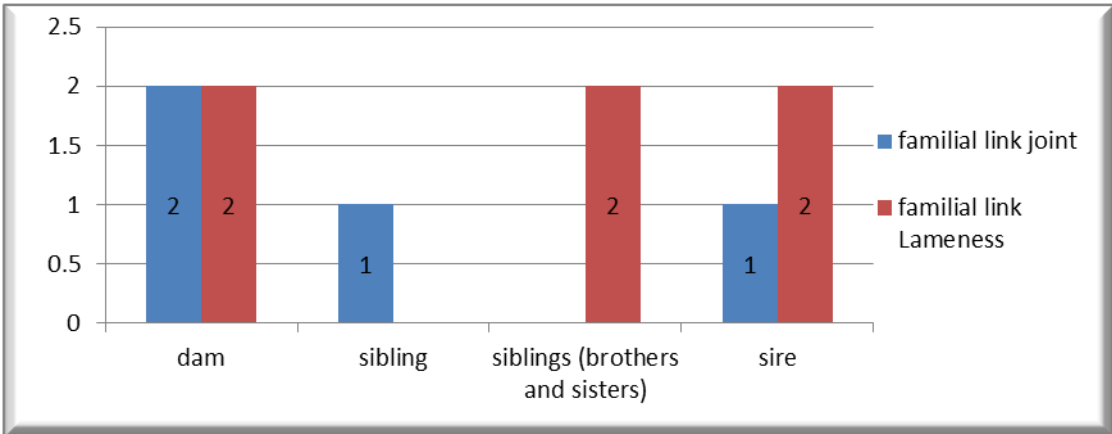


Fig 13 shows numbers of family members that have also had joint injuries (red bars) and those that have had joint stiffness (blue bars)

Thirteen chows were reported to have had CCLs in both legs (30% of total chows affected), the findings show that in these cases the second leg was affected after the first with only 4 chows (9% of total affected chows) that injured both legs at the same time. This suggests that sustaining a CCL injury in one leg is not a strong indicator that the dog will have a subsequent injury in the other leg. (fig 14)

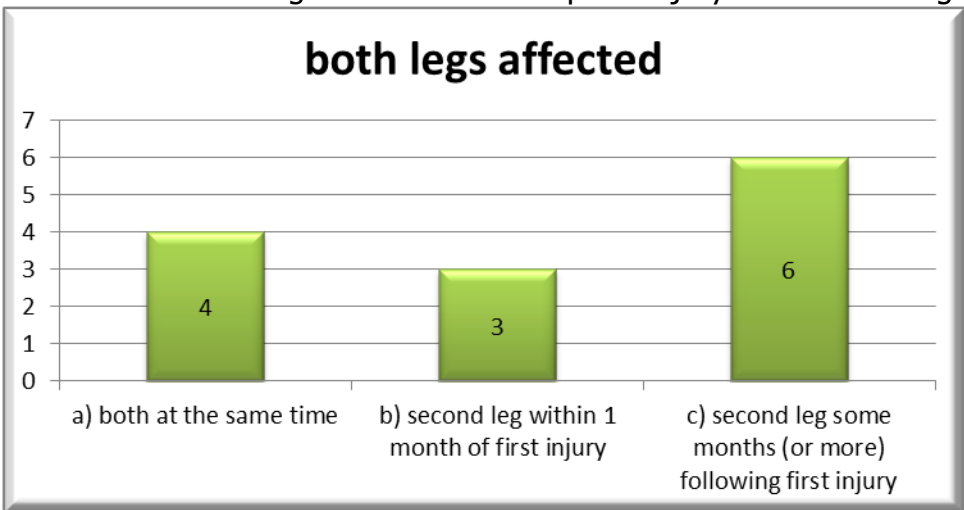


Fig 14 indicates the time differences between subsequent CCL injuries

Of the 42 affected dogs included in the survey 15 (35%) required surgery to repair the CCL to one leg and 5 (11%) required CCL repair surgery to both legs (fig 15)

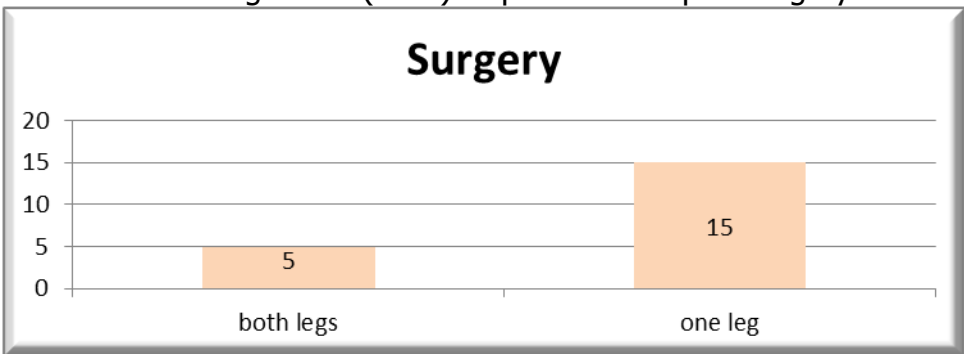


Fig 15 indicates number of chows requiring surgical repairs to CCLs to one or both hind legs.

## **Discussion**

The number of people that responded to the survey questionnaire was low. The questionnaire at first inspection appears very lengthy and complicated, however those that did respond found that in general they only had to fill in the first section and one of the age related sections. The number of chows included in the survey (357) was high, neutered chows were poorly represented while the number of females included was more than double the number of males. The disproportionate number of females included in the survey may have arisen if the survey responses came mainly from breeders who tend to keep larger numbers of females than males. When looking at the gender breakdown of affected chow as a percentage, neutered chows were more likely to have CCL injuries but in intact chows females were more likely to be affected by CCL injuries than males.

The largest number of reports relating to affected female chows fell into the category 'date of birth pre 1999', whilst some kennels still had records for this period many responders were relying on memory therefore reporting for the time period 'pre 1999' may not be as accurate as the more recent categories.

When looking at factors that may provide indicators for risk of CCL injuries, age appears to be the most consistent indicator across all the 'dob' categories with the majority of injuries occurring before the chow is 2yrs old and predominantly before one year of age. Whilst young dogs are highly active they are still developing bone structure and building muscle tone which may account for the high number of reports in this age group.

Most injuries seemed to occur during free range exercise (off lead) with other dogs and when the dog twisted suddenly, although a number of responses for 'other' noted that jarring the joint perhaps by stepping awkwardly off a kerb etc was also likely to result in injury. The responses to the questions on exercise regimes may have been affected by the number of responses that indicated that the respondent owned several chows. When looking at the raw data those with one or two chows were more likely to take their dogs for lead walks than those that owned a number of chows.

The dogs given regular formal road exercise were least likely to suffer injury, and it would have been useful to measure the results of affected dogs against those that had not had injuries. This would have required a further section to the survey which was already daunting at first glance.

Most of the affected chows fell into the under 19" category and weighing less than 55lbs this is not surprising when considering that the majority of chows were females.

The number of chows reported to have CCLs appears to be very low (42 in total) and less than half (20) required surgery. The number of affected dogs varied little between the three groups which might appear surprising when taking into consideration that the pre 1999 group contains the largest number of dogs by far.

This may be because long term chow owners/breeders may be more experienced in recognising and treating symptoms early without the need of veterinary treatments.

Very few respondents recorded similar injuries or joint lameness in close relatives. A number of respondents reported owning only one or two chows which suggests that they had purchased from a breeder and consequently may not be aware of the health status of close relatives. Similarly when breeders sell chow puppies the new owners may not inform them if the dog suffers a CCL injury especially when one considers that the injuries mainly occur during exercise periods particularly free playing with other dogs.

### **Conclusion**

Whilst the survey response was low the number of chows referred to in the responses was high. Caution must be used when looking at data relating to chows born before 1999 as some responses may rely more on memory than written records.

It would appear that neutered chows and intact bitches are more likely to incur a CCL injury than males and that chows (under 19") and weighing less than 55lbs are also more susceptible to CCL injuries. However weight and height when considered in the context that the largest number of reported chows were bitches whose weight and height measurements fall within the average range. It is unlikely that height or weight was a determining factor.

Exercise arrangements may be an important factor with half of those recorded with CCL injuries received mainly free running in the garden or run area with other dogs and the most common observation of cause was when the dog twisted suddenly. Moderately and highly active dogs were far more likely to have CCL injuries than 'couch potatoes'.

Most injuries were found to occur on or before one year of age (53%) and may reflect that musculature and bone structures are still developing and more prone to injury, especially in view of the more active behaviour of young puppies.

Very few reported any familial links for either joint injury or stiffness however this result must be viewed with caution as the respondents may not be aware of the status of any of the affected chows close family relatives.